METHOD AND COATING SYSTEM FOR REDUCING CARBONACEOUS DEPOSITS ON SURFACES EXPOSED TO HYDROCARBON FUELS AT ELEVATED TEMPERATURES

Abstract of Disclosure

A coating system and method for reducing the tendency for hydrocarbon fluids, such as fuels and oils, to form carbonaceous deposits that adhere to the walls of a containment article. Of particular concern are carbonaceous deposits that form at temperatures below about 650 ° F (about 345 ° C). The coating system combines an outermost layer of platinum with a ceramic barrier layer. The coating system has been shown to significantly reduce the formation of carbonaceous deposits at temperatures between about 220 ° F and 650 ° F (about 105 ° C to about 345 ° C), as well as reduce the adhesion of such deposits. The platinum outermost layer also serves as a radiation shield to reduce heat transfer from the containment article to the hydrocarbon fluid. The outermost layer is preferably deposited as an extremely thin film by chemical vapor deposition. The barrier layer is deposited to a thickness sufficient to prevent interdiffusion of the platinum outermost layer with the containment wall.

Figures